Applicant: <u>D & E Mining, LLC</u>

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

Part III - Operation Plan

## A. General Operation Information

1. Describe the type and method of coal mining procedures and major equipment to be used. (780.11)

See Attachment III-A-1

Major equipment to be used includes but may not be limited to:

Backhoes
 Dozers
 Loaders
 Dry Crusher
 Conveyors
 Service Trucks
 Bulk ANFO Trucks
 Track Backhoes
 Wet Screen
 Cyclones
 Centrifuges

- Pumps

2. Describe the sequence and timing of increments to be mined (as shown on permit map) over the total life of the permit. (780.11)

The timing increments are as follows:

Increment No.	Acres	From Estimate Life
1	23	Reclamation Phase
2	19	Currently Being Mined
3	20	End of Increment #2 12 Months
4	18	End of Increment #3 12 Months
5	20	End of Increment #4 12 Months
6	8	Issuance of Permit Life of Permit

The sequence of mining operations will be generally as follows:

- 1) Construction of Sediment Control Structures
- 2) Clearing and Grubbing
- 3) Topsoil Removal (if required)
- 4) Overburden Drilling and Blasting
- 4) Overburden Removal
- 6) Coal Recovery, including removal by augering, coal underlying the right-of-way of Jackson County Road 81.
- 7) Re-grading
- 8) Revegetation

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

# ATTACHMENT III-A-1 TYPE AND METHOD OF COAL MINING PROCEDURES

Post Revision R-2 will add the proposed coal processing plant to the existing coal stockpile area in the NE  $\frac{1}{4}$  of NE  $\frac{1}{4}$  of Section 18. This processing plant will allow the recovery of the entire coal seam where previously a portion of the seam was left in the mine cut at the bottom of the Aetna Seam. This will maximize the coal resources contained at the mine site and prevent wasting of coal reserves available for recovery.

The process begins by taking unusable coal thru a series of screens and washing equipment to de-slime and remove larger non-coal waste. After sizing, the coal is directed to Heavy Media Cyclones and Screens to reduce the ash content primarily. Then it is directed to de-watering cyclones and centrifuge where the effluent is directed to the clarifier tank where the underflow is pumped to the Slurry Pond and the cleaned coal goes to a conveyor belt leading to a stockpile for loading onto trucks.

During the process the refuse material is divided into wet slurry that is pumped to Slurry Impoundment 001 at a rate of approximately 21 tons per hour dry weight and coarse refuse at approximately 86 tons per hour. Coarse refuse will be hauled to the active pit by trucks normally used for the removal and stockpile of coal at the pit. Demand/availability for saleable product, availability of equipment and weather conditions will determine the amount of coal hauled to the plant and therefore the refuse transported each month.

P-3935 contains approximately 53 mining acres available as the proposed location to place the Coarse Refuse from the Processing Plant. Two drill holes DEF2OB-2 and DEF2MW-3 was drilled and samples were collected every five feet or change in lithology by qualified PERC Engineering Co., Inc. personnel and analyzed for ph & neutralization potential by the PERC Engineering Laboratory according to ASTM Standards. The holes lies within the Permit Boundary and contains an average of -9.063 (tons CaCO3/1000 tons overburden) neutralization potential. The neutralization potential will be raised to a positive value with added agricultural lime in the amount of 51.4 tons per acre per two foot lift of refuse and will allow the disposal, compaction and coverage of the refuse in accordance with the detailed design plan without adversely affecting the groundwater quality as demonstrated on Attachment III-A-5. An addition 5 tons per acre will be placed on the subgrade below the refuse and on the top of the refuse just prior to covering the refuse with 4 feet of the best available non-toxic, non-acid forming material. Surface drainage will not be affected since the refuse material will be buried in the upper portion of the active spoil a minimum of 4 feet deep but a high as possible to prevent contact with the post mining ground water and treated to provide any neutralization required. Make-up water for the system will be pumped from either Basin 009A, 009 or Slurry Impoundment Slurry Impoundment 001 will be used as a water source only in emergency situations.

Increment No. 1 has been mined as previously approved and is

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

currently in reclamation phase. Increment No. 2 is currently being mined as previously approved in the original permit application. Increment No. 3, No. 4 and No. 5 will be mined as previously approved in the original permit application and subsequent revision.

The addendum to the operation plan is to modify the plan to add a preparation plant and allow for onsite disposal of coarse and fine refuse onto previously mined area within a portion of Increment No. 1,No. 2 and No. 3 as identified on Attachment III-A-1, Operations Map.

See Attachment III-A-1, Operations Map.

See Attachment III-A-5, Refuse Disposal Plans.

# **INTERVAL: DESCRIPTION:** 0 Surface Material 5 - 10weathered Sandstone, light to medium orange, soft to medium 10 10 - 15weathered Sandstone, light to medium orange, soft to medium 15 15 - 20weathered Sandstone, light to medium orange, soft to medium 20 20 - 25weathered Sandstone, light to medium orange, soft to medium 25 25 - 30weathered Sandstone, light to medium orange, soft to medium 30 30 - 35Sandstone with Shale, light to medium gray, soft to medium 35 35 - 38Coal (Aetna Seam) (taken from driller's log), sample lost 38 - 43Sandstone, light to medium gray, soft to medium



D & E Mining Co., LLC. Flat Rock No. 2 Mine Lithologic Description for **DEF20B-2** 

SHEET 1 OF 1 DRILL: Drilltech DK50 SURFACE ELEVATION:

±1362.00ft. MSL

DRAWN BY: JNG DATE: 2-20-09 DWG. NAME: DEF2LITH APPROVED BY: TST SCALE: 1" = 10' vertical



Telephone: Facsimile:

(205) 384-5553

(205) 295-3114 - Main Building (205) 295-3115 - Water Lab

Web Address: www.percengineering.com

ATTACHMENT III-A-1

COMPANY NAME: D & E Mining LLC

MINE NAME:

Flat Rock #2

DRILL HOLE:

DEF2OB-2

COLLECTED BY:

SR

DATE COLLECTED:

5-5-2008

ANALYZED BY:

BS

DATE ANALYZED:

12-16-2008

All analysis is performed according to

EPA standards.

	INTERVAL		PASTE pH	% SULFUR	MAX. POT. *ACIDITY	NEUT. *POT	A-B *ACCOUNT	ACID FORMING
	0.00	5.00	4.630	0.030	0.938	0.001	-0.937	N
	5.00	10.00	5.060	0.030	0.938	3.750	2.813	N
	10.00	15.00	4.580	0.030	0.938	1.880	0.943	N
	15.00	20.00	4.870	0.030	0.938	0.001	-0.937	N
	20.00	25.00	4.830	0.030	0.938	1.250	0.313	N
	25.00	30.00	4.480	0.030	0.938	0.001	-0.937	N
	30.00	35.00	4.220	0.030	0.938	1.250	0.313	N
	35.00	38.00 Coal		0.310	9.688 Coal	C	OAL	***
	38.00	43.00	3.110	0.160	5.000	1.750	-3.250	N
**AVERA	GE		3.922	0.046	1.445	1.235	-0.210	N

<sup>\*</sup>Calculated in tons CaCo3 per 1000 tons of material.

<sup>\*\*</sup>Averages do not include coal seam to be mined or intervals below lowest seam.
\*\*\*Not analyzed

INTERVAL:

**DESCRIPTION:** 

ATTACHMENT III-A-1



D & E Mining Co., LLC. Flat Rock No. 2 Mine Lithologic Description for DEF2MW-3

= 10' vertical

DRAWN BY: JNG DWG. NAME: DEF2LITH		DATE:	2-20-09	
APPROVED BY:	TST	SCALE:	1" = 10'	

SHEET 1 OF 1 DRILL: Drilltech DK50

SURFACE ELEVATION:

±1364.00ft. MSL



Telephone: Facsimile:

(205) 384-5553

(205) 295-3114 - Main Building (205) 295-3115 - Water Lab

Web Address: www.percengineering.com

ATTACHMENT III-A-1

COMPANY NAME: D & E Mining LLC

MINE NAME:

Flat Rock #2

DRILL HOLE:

DEF2MW-3

COLLECTED BY:

SR

DATE COLLECTED:

5-5-2008

ANALYZED BY:

JC, SWR

DATE ANALYZED:

3-13-2008

All analysis is performed according to EPA standards.

INTE	RVAL	PASTE pH	% SULFUR	MAX. POT. *ACIDITY	NEUT. *POT	A-B *ACCOUNT	ACID FORMING
0.00	2.00	4.070	0.015	0.469	1.250	0.781	N
2.00	5.00	4.490	0.026	0.813	1.250	0.438	N
5.00	10.00	4.830	0.027	0.844	0.500	-0.344	N
10.00	15.00	4.590	0.027	0.844	2.750	1.906	N
15.00	20.00	5.270	0.026	0.813	1.250	0.438	N
20.00	25.00	5.870	0.027	0.844	0.500	-0.344	N
25.00	27.00	5.890	0.026	0.813	2.500	1.688	N
27.00	32.00	7.190	0.030	0.938	3.750	2.813	N
32.00	35.70	7.960	0.034	1.063	4.500	3.438	N
35.70	38.40 Co	al	0.274	8.563 Coal	(	COAL	***
38.40	43.00	3.490	0.114	3.563	1.000	-2.563	N
**AVERAGE		4.305	0.037	1.159	1.892	0.733	N

<sup>\*</sup>Calculated in tons CaCo3 per 1000 tons of material.

<sup>\*\*</sup>Averages do not include coal seam to be mined or intervals below lowest seam.
\*\*\*Not analyzed

Mine Name: Flat Rock Mine No. 2

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3. Attach a narrative explaining the construction modification, use, maintenance, and removal of the following facilities: (780.11)

- (a) Coal removal, handling, storage, cleaning and transportation structures and facilities; See Attachment III-A-1
- (b) Spoil, coal processing waste and non-coal waste removal, handling, storage, transportation and disposal structures and facilities;
- (c) Mine facilities; and
- (d) Water pollution control facilities.

See Attachment III-A-3

- 4. Describe the means to be used to maximize the use and conservation coal reserves in the permit area. (780.18, 816.59) Some of the measures are:
- A) Mining the deepest seam that is economically feasible to mine.
- B) Rehandling overburden in order to maximize coal recovery that would normally be lost in the toe of the spoil.
- C) Processing and blending coal that in its "raw" condition would not have a market.
- D) Removing by augering, coal underlying the right-of-way of Jackson County Road 81 that would otherwise not be recovered.
- 5. Describe measures to be taken to ensure that all debris, acid-forming and toxic-forming materials and materials constituting a fire hazard are disposed of in accordance with 816.89 and 816.103; include contingency plans to prevent sustained combustion of such material. (780.18)

In an effort to prevent the formation of acid mine drainage, the open pits will be cleaned of coal cleanings produced as a result of the recovery of the seams. Each pit will be cleaned before backfilling with overburden material from the following The removed material will be stored within the coal stockpile for further blending or shipped offsite for further processing. Any pit cleanings that cannot meet marketable quality will be buried within the permit area a minimum of 4 feet and a maximum of 10 below the final reclaimed surface. The disposal area will be no closer than 30 feet from any reclaimed highwalls and 50 feet from any drainage courses. After the coal stockpiles have served their useful purpose, the coal pad material that is of marketable quality will be shipped directly to the end user or offsite for further processing. Any coal pad material that can not meet marketable quality will be excavated to a point where the underlying material is uncontaminated and buried within the permit area a minimum of 4 feet and a maximum of 10 below the final reclaimed surface. The disposal area will be no closer than 30 feet from any reclaimed highwalls and 50 feet from any drainage courses.

Mine Name: Flat Rock Mine No. 2

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All non-coal waste and debris which may be accumulated at the site (including paper and wood shipping containers, empty oil containers, worn out machine parts, etc.) will be confined in appropriate temporary containers or storage areas and periodically transported to an offsite disposal area which meets all Federal, State and local laws and ordinances for permanent disposal of such materials.

After placement, these materials will be covered with a minimum of 4 feet of the best available non-acid and non-toxic forming, and non-combustible material. The surface of this cover will be crowned or sloped to prevent infiltration of surface water into the disposed material.

Mine Name: Flat Rock Mine No. 2

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#### Attachment III-A-3

3.a) Crushing and screening of the coal to be mined will be performed utilizing a portable plant transported to the site by truck and erected on site. Regular maintenance will consist of routine lubrication, oil checking and changing as necessary, etc. and will be conducted during the period the crusher and/or screen is in use. When no longer needed the plant will be disassembled and transported offsite by trucks.

Clearing and grubbing of the construction site will begin prior to the construction of the preparation plant, conveyor systems, rotary breaker, holding bins, and transfer houses. The foundation area will be graded to the appropriate grades necessary to facilitate the construction operation. Upon completion of the grading operations the concrete foundations were poured at the required locations for the facility. The preparation plant, conveyor systems, rotary breaker, holding bins, and transfer houses components were transported to the facility for final assembly. The preparation plant will have a capacity of 250 tons per hour of Dependent upon the market for specific coal mine run coal. products, additional washing methods may be added to this facility. Any problems that may arise will be handled by the proper consulting personnel. Modifications to the preparation plant, conveyor systems, rotary breaker, holding bins, and transfer houses will be performed as necessary to upgrade and update the facilities during the life of the mine. Maintenance will consist of the lubrication of the various moving components and replacement of worn components when necessary. When no longer needed, the preparation plant, conveyor systems, rotary breaker, holding bins, and transfer houses will be disassembled and removed from the site. All concrete foundations will be removed and disposed of within an offsite disposal area which meets all Federal, State and local laws and ordinances for permanent disposal of such materials. The site will be graded to match the approximate original contour. disturbed areas will be vegetated with an appropriate combination of grasses and legumes as stated in the reclamation plan, fertilized, and mulched to ensure a permanent diverse vegetative cover.

b) All fine coal processing waste produced from the Flat Rock Mine No. 2 will be disposed of within Slurry Impoundment No. 1.

"Drisco" type polythene pipe will be used to pump fine coal wastes to the Slurry Impoundment. Preparation for the pipeline corridor will consist of the clearing and grubbing of the areas. Use and maintenance of the pipelines will consist of replacement of damaged or malfunctioning sections of the pipeline, repair of leaks as they develop, and the addition of pipeline when needed. Upon the termination of pumping operations, the pipelines will be flushed to ensure that no fine coal wastes or sediment deposits are present in the pipelines and dismantled and removed from the site. All Disturbed areas will be fertilized, seeded with a seed mixture approved in the reclamation plan, and mulched to ensure a pemanent

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

diverse vegetative cover.

Slurry Impoundments No. 1 will be used to collect and store fine coal waste produced from the washing operations at this facility and will be inspected and maintained until reclamation of the area is complete. Maintenance of Slurry Impoundment No. 1 will include but not be limited to removal of accumulated sediment to be stored on site temporary until drying occurs and then disposal in the mine spoil in the same manner as the coarse refuse on site. Any subsequent modifications that may be required will be conducted the general supervision of a qualified registered professional engineer and will be done in accordance with the approved design plans. The embankments will be constructed of the best available soil material based on soil strength parameters. The dam core wall will bear on unyielding, relatively impermeable consolidated rock and the balance of the dam structure on the prepared compacted natural soil material present at the site. The dam will be built in horizontal lifts beginning at the lowest point of the foundation with each lift being thoroughly compacted. The drainage structure will be installed as outlined on the detailed design plans and will be stabilized with respect to erosion using riprap, concrete paving, energy dissipaters, vegetation otherwise. After construction of the impoundment, the dam and all areas disturbed by construction will be limed, fertilized, and seeded with an appropriate mixture of grasses and legumes approved in the reclamation plan, then mulched.

Routine maintenance of Slurry Impoundment No. 1 will consist of spot seeding, fertilization and mulching to insure that a good vegetative cover is maintained on the dam and areas around the impoundment, repair and stabilization of any rills and gullies which may develop, and repairs to discharge structures and erosion protection structures as required. Slurry Impoundment No. 1 will be inspected two (2) times a month by the operator's personnel and annually by a registered professional engineer and any required maintenance will be completed at the earliest possible time by the operator.

If during the term of the permit Slurry Impoundment No. 1 require modifications, modification plans will be submitted to the Regulatory Authority for approval prior to any modifications. Upon modifying the slurry impoundment, the slurry impoundment will be certified to the Regulatory Authority.

When the accumulated solids contained within Slurry Impoundment No. 1 reaches the solids storage volume specified within the detailed design plans, Slurry Impoundment No. 1 will be cleaned out with the sediment removed to be stored on site temporary until drying occurs and then hauled to the mine spoil area and disposed of as required by coarse refuse disposal plans. Upon completion of operations reclamation shall proceed in the following manner. Slurry Impoundment No. 1 will be dewatered in an environmentally safe manner (such as siphoning, pumping, etc.). A diversion will be

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

constructed around Slurry Impoundment No. 1 to route upstream drainage around the reclaimed pond area. Using existing non-toxic, non-flammable breaker and washer rejected rock materials, construct a working surface on the impoundment which will permit equipment travel for the placement of vegetative cover material and to provide for positive drainage. All rock fill slopes on the impoundment shall have a maximum and minimum grade of 5 percent and 1 percent, respectively. All breaker and washer rejected rock fill shall be spread in one (1) foot maximum layers with a minimum compaction of 90 percent of its maximum dry density as determined by the standard proctor compaction test. The thickness of the rock material will be no more than is necessary to support equipment which will be working upon the impoundment surface. Upon the completion of the above mentioned working surface, the graded impoundment surface will be covered with a minimum of four (4) feet of the best available non-acid and non-toxic forming and noncombustible material. All disturbed areas will be vegetated with an appropriate combination of grasses and legumes as stated in the reclamation plan, fertilized, and mulched to ensure a permanent diverse vegetative cover. Soil amendments, including lime and fertilizer, will be added and disced into the cover material in rates as recommended by laboratory analysis performed upon the cover material. These soil amendments will ensure a diverse effective vegetative growth upon the material.

Coal will be transported directly to this facility via trucks from within this operation mining operations and future D & E Mining operations within the surrounding area. The coal will be stockpiled on site until it is processed. Clearing and grubbing of the construction site began prior to the construction of the preparation plant, conveyor systems, holding bins, and transfer houses. The foundation area will be graded to the appropriate grades necessary to facilitate the construction operation. Upon completion of the grading operations the concrete foundations will be poured at the required locations for the facility. The preparation plant, conveyor systems, holding bins, and transfer houses components were transported to the facility for final assembly.

Sediment control consist of Sediment Basins 009 Modifications to the conveyor systems, and holding bins will be performed as necessary to upgrade and update the facilities during the life of the mine. Maintenance will consist of the lubrication of the various moving components, replacement of worn components when necessary, and the periodic inspection and cleanout of the conveyor catch pans. When no longer needed, the conveyor systems, and holding bins will be disassembled and removed from the site. All concrete foundations will be removed and disposed of within an offsite disposal area which meets all Federal, State and local laws and ordinances for permanent disposal of such materials. The sites will be graded to match the approximate original contour. disturbed areas will be vegetated with an appropriate combination of grasses and legumes as stated in the reclamation plan, fertilized, and mulched to ensure a permanent diverse vegetative cover

# Washer Refuse Disposal Plan

One item proposed under Revision R-2 at the Flat Rock No. 2 Mine is to add a portable washing facility. It is proposed that this facility will wash the coal recovered from this mine site, and (if successfully permitted) a future adjacent mine site which will recover coal from both the Upper Cliff and Aetna Coal Seams, same as that currently recovered at the Flat Rock No. 2 Mine. The coarse and fine refuse from the washing operations will be placed in an on-site Refuse Disposal Area as shown on the attached Refuse Disposal Area Map.

The Refuse Disposal Area shown on this map occupies 52.67 acres. Compacted washer refuse is proposed as being limited to four feet thick to prevent contact and subsequent contamination of on-site groundwater, therefore the amount of coarse and fine refuse to be placed at the Flat Rock No. 2 Mine will be 210.68 acre-ft. or 9,177,221 cubic feet.

Based on a density of 135 pounds per cubic foot for coarse refuse and 110 pounds per cubic foot for fine refuse (or dry slurry) and a ratio of 86 tons of coarse refuse per 107 tons of washer refuse (or 80.37%) and 21 tons of fine refuse (or dry slurry) per 107 tons of washer refuse (or 19.63%), the weighted density of washer refuse to be placed in the Refuse Disposal Area is 130.1 pounds per cubic foot. Based on this value, the amount of refuse to be placed in the Refuse Disposal Area is as follows:

(9,177,221 cubic feet)(130.1 pounds per cubic foot)/ (2,000 pounds per ton) = 596,978 tons of washer refuse

The amount of 'raw' or unwashed coal which would produce this amount of refuse, based on a 250 ton coal run supplied by the coal washer manufacturer (see attached) is:

(596,978 tons of refuse)(250 tons raw coal)/(107 tons of refuse) = 1,394,808 tons of raw coal

The originally permitted amount of coal to be recovered at this site is calculated as 521,326 tons (or 13,033,152 cubic feet) of raw coal. Based on the current location of the highwall, the amount of coal remaining to be recovered is 402,076 tons (or 10,051,906 cubic feet). The amount of coal remaining includes approximately 5.3 acres of Upper Cliff coal and 76.1 acres of Aetna coal. Therefore the amount of raw coal that could be washed from the adjacent operation is 992,732 tons.

As shown on the attached 'Refuse Disposal Area Map', the Refuse Disposal Area is proposed to be located within the entire mine site, with 100 ft. offsets from sediment basins, public roads, and diversion ditches, and 50 ft. offsets from drainage courses. As mining progresses, and the spoil in these areas are graded, the area delineated on the 'Refuse Disposal Area Map' will become available for washer refuse deposition. Compacted washer refuse is proposed as being limited to four feet thick to prevent contact and subsequent contamination of on-site groundwater.

During normal coal washing operations, both coarse and fine washer refuse will be periodically transported to the Refuse Disposal Area by either Trucks and/or Loaders listed in Part III-A-1. Disposal of washer refuse at this site is proposed as follows:

1) The Washer Refuse Disposal Site will be located as shown on the attached 'Refuse Disposal Area Map', on a previously mined and regraded area, a

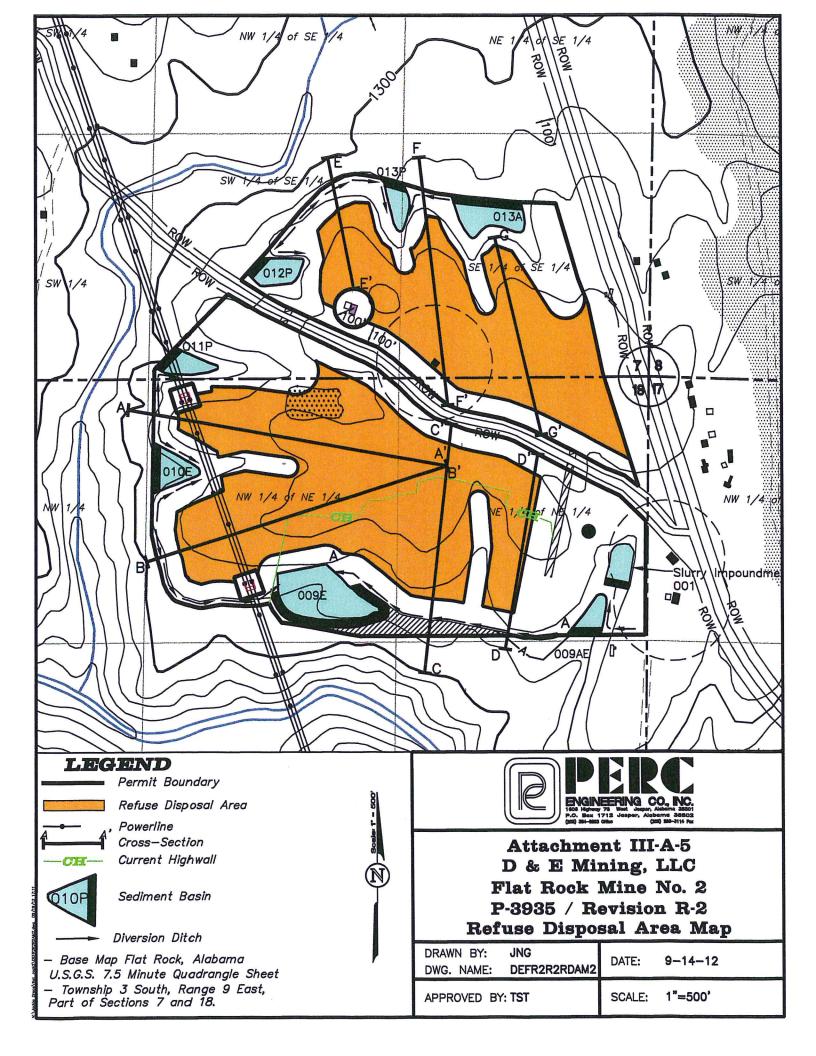
- minimum of 100 feet from sediment basins, public roads, and diversion ditches, and a minimum of 50 ft. from drainage courses.
- 2) The Washer Refuse Disposal Site will be excavated and/or graded into the regraded spoil such that when four feet of compacted refuse is deposited in the disposal site, the top of the compacted refuse will be a minimum of four feet beneath the surface of the regraded material while maintaining A.O.C..
- 3) Prior to refuse deposition, the floor of the Washer Refuse Disposal Site will be covered with an application of agricultural lime at the rate of 5 tons per acre.
- 4) The washer refuse will be placed into the Washer Refuse Disposal Area and compacted in two 2 ft. lifts by either a D9 or D10 Dozer by making two passes with the blade 'up' to compact the refuse to 90% of the standard proctor.
- 5) Both the coarse and fine washer refuse will be sampled at a rate of one sample per ½ acre per two ft. lift (approximately one sample per 2,800 tons of refuse) and a liming rate will be calculated for that ½ acre from the average of the two acid-base account results as shown from the example below. The calculated amount of lime needed to neutralize the washer refuse for that ½ acre (two feet thick) will be mixed into the washer refuse utilizing equipment mentioned in Part III-A-1.
- 6) Prior to covering the top of the compacted washer refuse with spoil, the top of the compacted washer refuse will be covered with an additional application of agricultural lime at the rate of 5 tons per acre.
- 7) After the four feet of compacted washer refuse has been placed in the disposal area, the compacted washer refuse will be covered with the best non-toxic, non-acid forming material available.

# **Liming Rate Example:**

Currently, there is no geochemical (acid-base account) analysis of the washer reject from the Aetna Coal Seam. However, the approved Hydrogeologic Evaluation for this permit (in Part II-E) reveals that the average sulfur content of the Aetna Seam is 0.29 percent. Therefore, <u>IF</u> the sulfur content of the washer reject from the Aetna Seam was analyzed as 0.29 percent, and the N.P.\* was zero, the per acre liming rate for a two ft. lift of this material would be as follows:

- a) Acid Base Account calculation: A-B Account = N.P.\* (%S)(31.25) (0) (0.29)(31.25) = -9.063 (tons CaCO3/1,000 tons material) (Negative A-B Account number indicates a deficiency of neutralization)
- \*N.P. = Neutralization Potential (note negative NP's are added as a negative value).
  - b) Weight of Washer Refuse calculation: Weight of 2 acre ft. of Washer Refuse = (volume of material)(density\*\*) (2 ft.)(43,560 ft²/acre)(130.1 lbs/ft³)/(2,000 lbs./ton) = 5,667 (tons/acre)
- \*\* Average density of fine and coarse refuse
  - c) Conversion of Refuse Weight into "Acid Base Account" Units:
     weight units for acid-base accounting are per 1,000 tons material, therefore:
    5,667 (tons/acre)/(1,000) = 5.667 (1,000 tons/acre)
  - d) Liming Rate Calculation: Liming\*\*\* Rate = (A-B Account)(Refuse Weight) (9.063 (tons CaCO3/1,000 tons material))((5.667 (1,000 tons/acre)) = 51.36 tons of CaCO3 per acre per 2 ft. lift
- \*\*\*Calcitic (agricultural) Lime has a 100 percent CaCO3 equivalency. If another type of lime is used, the tons of CaCO3 per acre would have to be divided by the CaCO3 equivalency for that material to determine the liming rate for that material.
- 8) The calculated amount of lime needed to neutralize the washer refuse for each ½ acre area will be mixed into the washer refuse <u>prior</u> to that area being covered by the best available material.
- 9) The boundary of the Washer Refuse Disposal Site (which is filled with washer refuse) will be located by survey upon termination of the washing & refuse deposition operations at this site and a map of the surveyed boundary will be submitted to the Regulatory Authority for review.
- 10) After the Washer Refuse Disposal Site has been covered by a minimum of four feet of the best non-toxic, non-acid forming material available, the surface will be treated with soil amendments and limed as outlined in Part IV-C-1 of the permit application, planted with a diverse mixture of perennial grasses as outlined in Part IV-C-5 of the permit application, and mulched as necessary.

See attached Cross-Sections A-A' through G-G'. The location of the cross-sections are found on the attached Refuse Disposal Area Map.





Kentucky Natural Resources Modular Coal Preparation Plant Taggart Global Project Number 4430 August 31, 2012 Revision A

August 6, 2012

**VIA EMAIL** 

Attention:

Leslie G. Stephens

**SUBJECT:** 

KENTUCKY NATURAL RESOURCES REFUSE LOADING

MODULAR COAL PREPARATION PLANT TAGGART GLOBAL JOB NUMBER 4430

Dear Leslie Stephens,

The following table defines the plant refuse loading for the nominal and low yield cases. The tons shown are in dry tons, with the coarse being the tons that would report to the refuse belt and stockpile and slurry being the ultrafine tons pumped away to the slurry pond. The refuse tons are based on a 250 dry ton per hour plant feedrate.

REFUSE TONS PER HOUR DRY					
Description	Nominal Yield	Low Yield			
Coarse	86	150			
Slurry	21	24			
TOTAL	107	174			

Table 1: Dry Basis refuse tons at the nominal and low yield cases

Taggart looks forward to working with Kentucky Natural Resources and PERC Engineering Co., Inc. Should you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted, TAGGART GLOBAL, LLC

Andy Dynys

Vice President - Process Engineering

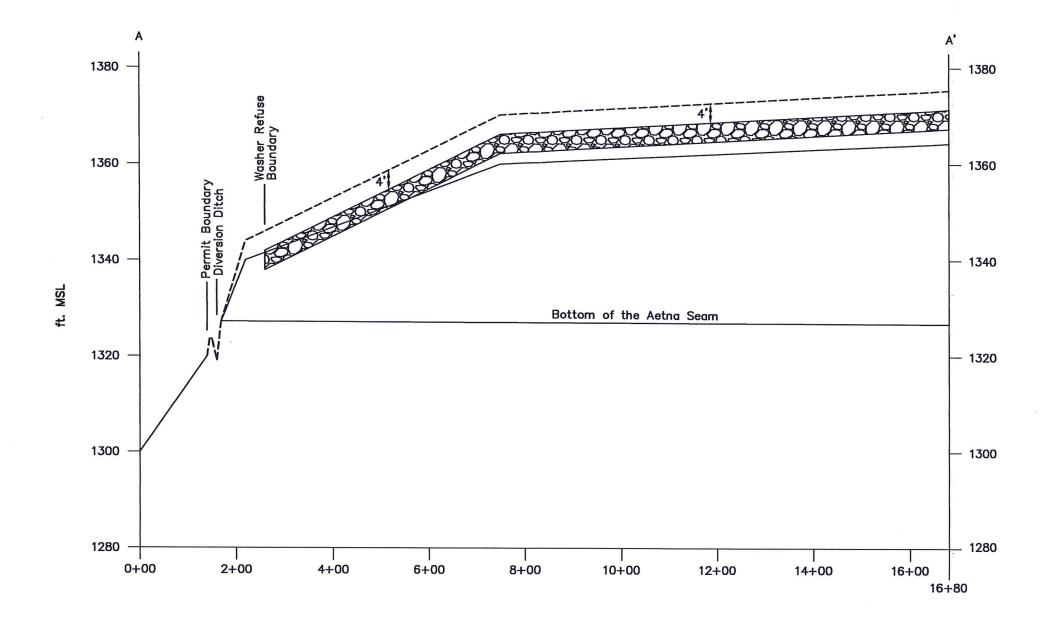
Cc:

D. Placha, J. Stasko, M. Ferguson, E. Wolfe File -

**Taggart** 

**Enclosures:** 

**Process Flowsheet** 



ENGINEERING CO., INC
1-00 1-600 1-600 1-70 West Joseph Alexand 30200
P. D. Joseph A. Joseph A. Alexand 30200
(NO) 384-5031 Office (10) 397-3114 Fe

D & E MINING, LLC.
FLAT ROCK MINE NO. 2
P-3935 / REVISION R-2
ATTACHMENT III-A-5
CROSS-SECTION A - A'

DRAWN BY: GOR DWG. NAME: DEFR2R2_xsec	DATE:	9-19-2012
APPROVED BY: TST	SCALE:	as noted

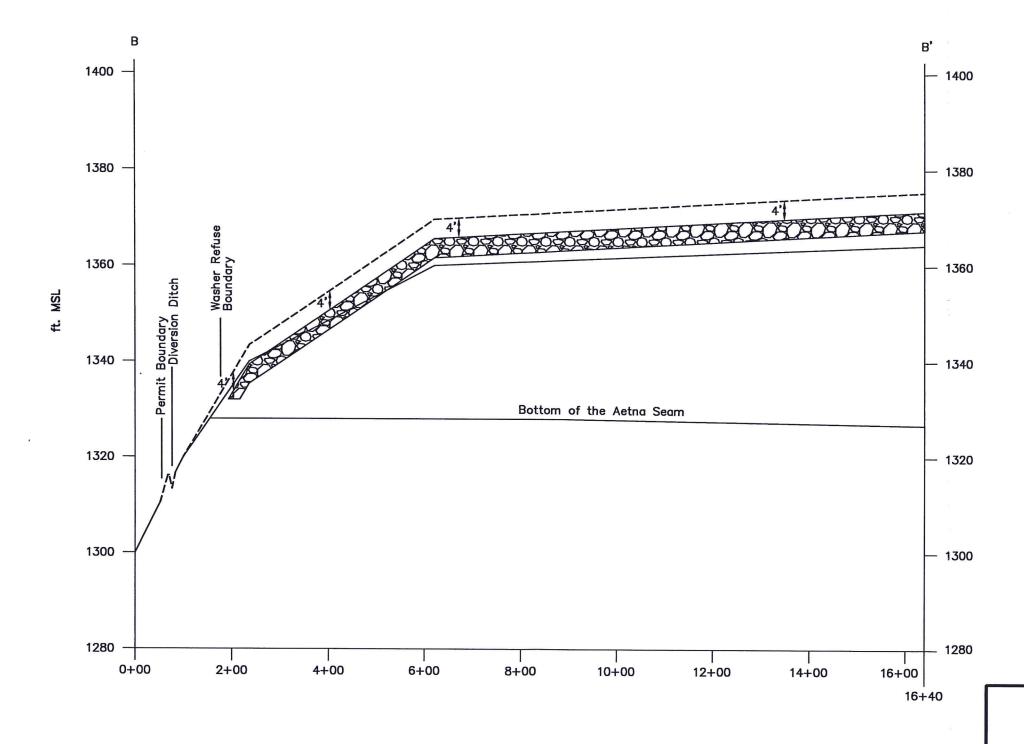
LEGEND:

PRE-MINE SURFACE
PROPOSED FINISH GRADE

1" = 200' HORZ. 1" = 20' VERT.

WASHER REFUSE DISPOSAL AREA

le Grace\fiat\_rock2\DEFRZR2\_xeec.dwg 09/19/12 19:4



ENGINEERING CO., INC.
1606 Highway 78 West Jasper, Assorma 35501
P.O. Box 1712 Jasper, Aslaborma 35502
(20) 384-5335 Office
(20) 384-5355 Office
(20) 384-535 Of

D & E MINING, LLC.

FLAT ROCK MINE NO. 2

P-3935 / REVISION R-2

ATTACHMENT III-A-5

CROSS-SECTION B - B'

DRAWN BY: GOR DWG. NAME: DEFR2R2_xsec	DATE:	9-19-2012
APPROVED BY: TST	SCALE:	as noted

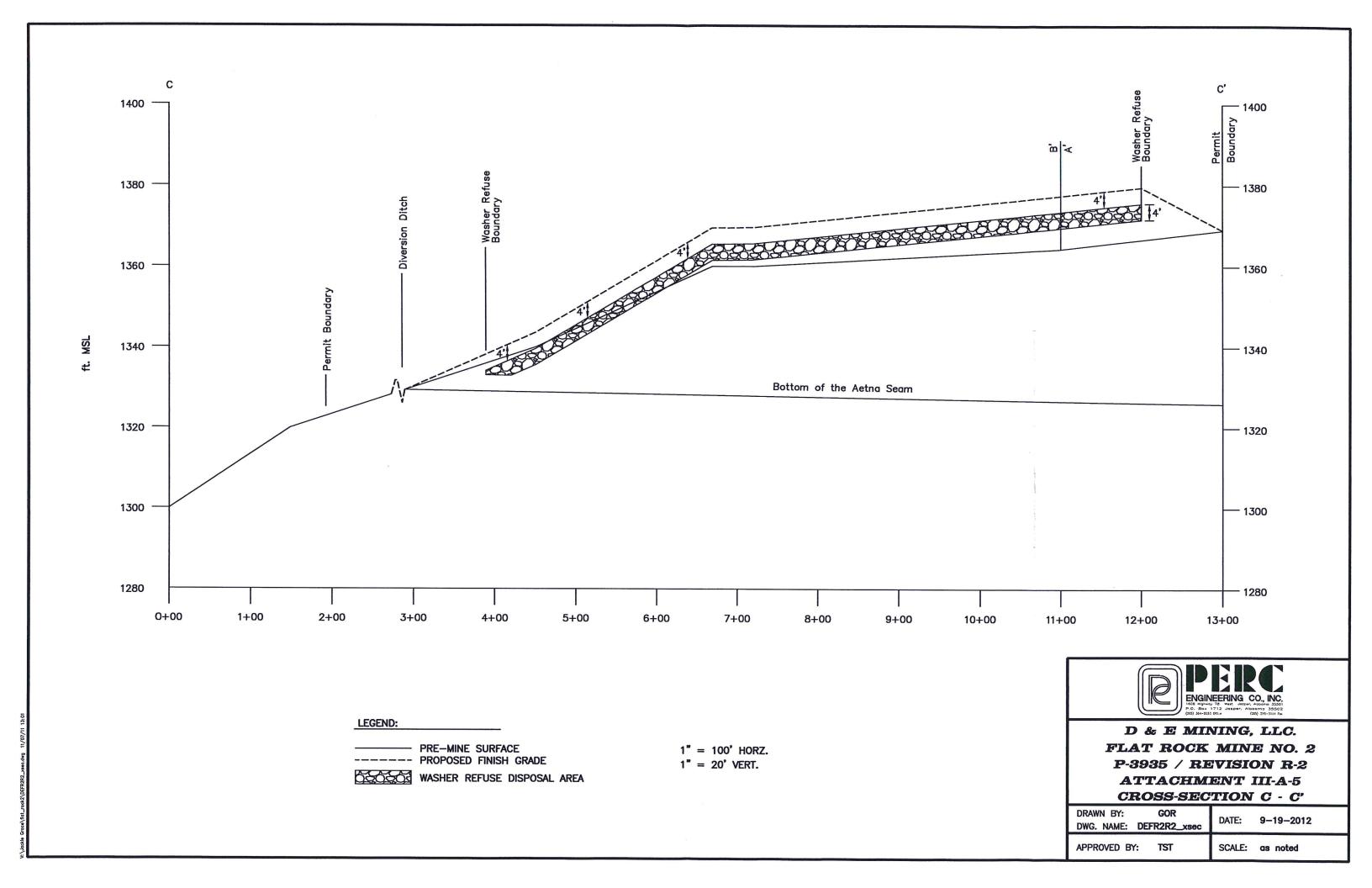
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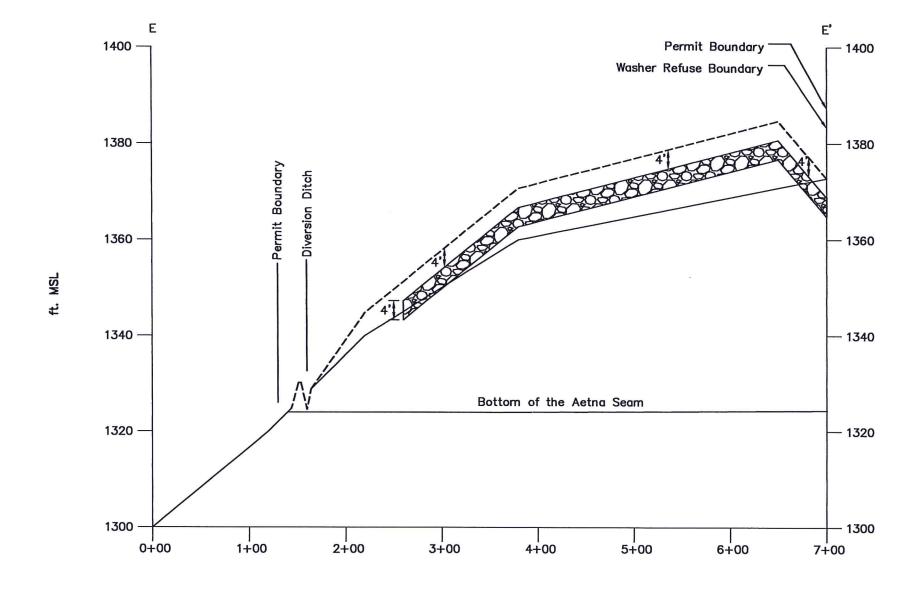
PRE-MINE SURFACE
PROPOSED FINISH GRADE
WASHER REFUSE DISPOSAL AREA

1" = 200' HORZ.

1" = 20' VERT.

V: COCKIO GIGGE HIGH DOCKY OFFICER X80C. DWG





1" = 100' HORZ. 1" = 20' VERT.

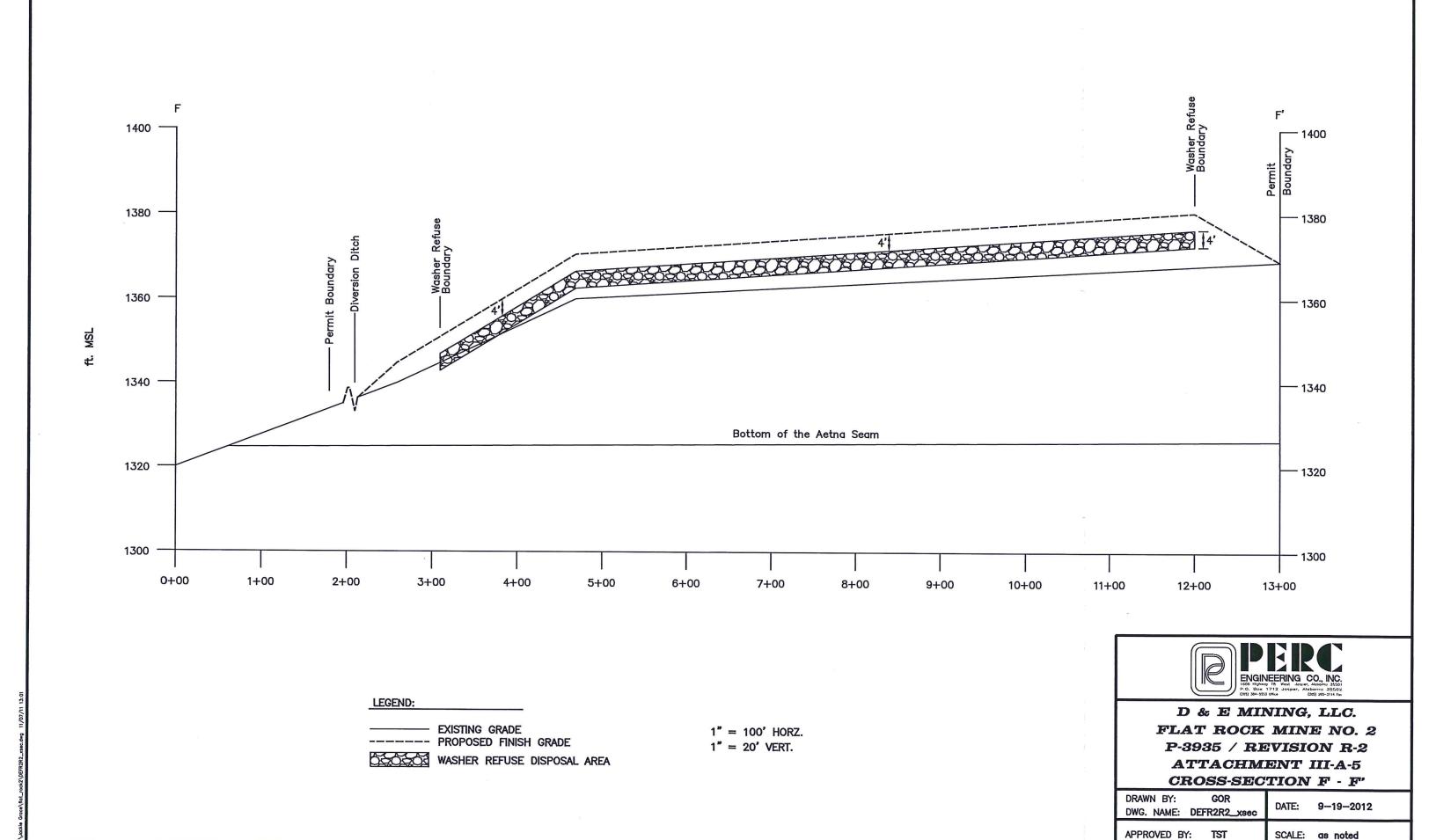


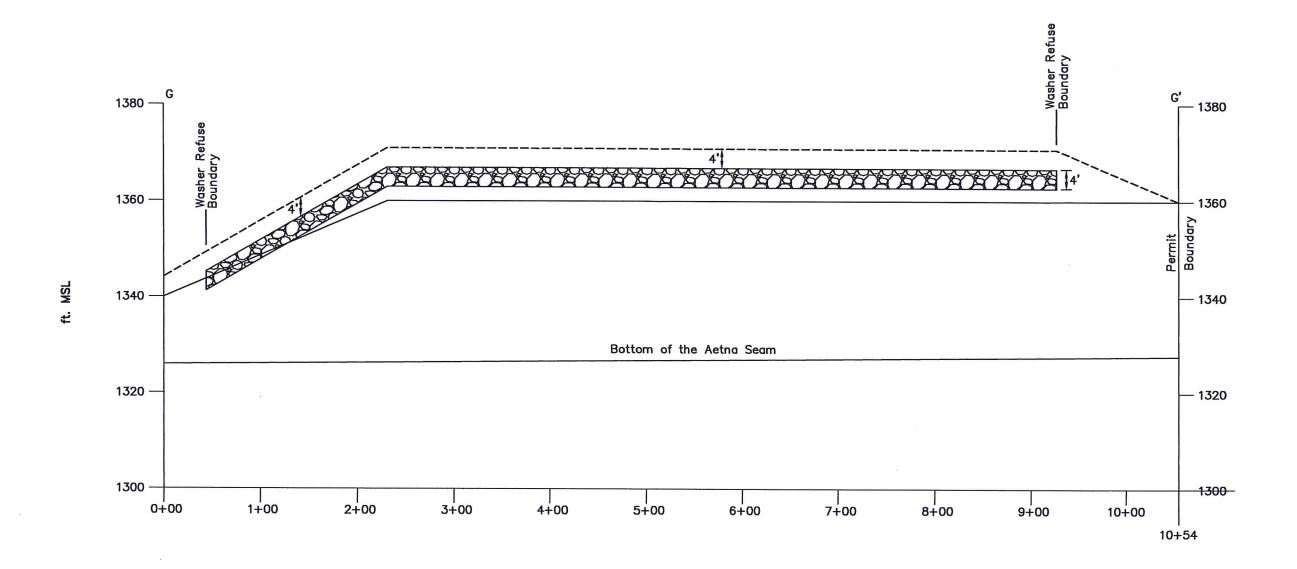
D & E MINING, LLC.
FLAT ROCK MINE NO. 2
P-3935 / REVISION R-2
ATTACHMENT III-A-5
CROSS-SECTION E - E'

DRAWN BY: GOR
DWG. NAME: DEFR2R2\_xsec DATE: 9-19-2012

APPROVED BY: TST

SCALE: as noted







D & E MINING, LLC. FLAT ROCK MINE NO. 2 P-3935 / REVISION R-2 ATTACHMENT III-A-5 CROSS-SECTION G - G'

DRAWN BY: **GOR** DATE: 9-19-2012 DWG. NAME: DEFR2R2\_xsec APPROVED BY: TST SCALE: as noted

LEGEND:

EXISTING GRADE

---- PROPOSED FINISH GRADE

1" = 100' HORZ.

1" = 20' VERT.

WASHER REFUSE DISPOSAL AREA

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

- 2. Ponds, impoundments, banks, dams and embankments. (780.25)
- (a) Submit a general plan which complies with Section 780.25(a)(1) for each proposed sedimentation pond, water impoundment, and coal processing waste bank, dam or embankment to be located within the proposed permit area.

  See attachment III-B.-2.A
- (b) Submit detailed design plans which comply with Sections 780.25(a)(2 and 3) and 816.46 for each sedimentation pond to be constructed on the increment you currently propose to mine. If the sediment pond is to remain as a permanent water impoundment, design plans shall also comply with Section 816.49.

  See attachment III-B.-2.A
- (c) Submit detailed design plans which comply with Sections 780.25(a)(2 and 3) and 816.49 for each temporary or permanent water impoundment to be constructed on the increment you currently propose to mine.

  See attachment III-B.-2.A
- (d) Submit detailed design plans which comply with Sections 780.25(a) (2 and 3) and 816.81-816.85 for each coal processing waste bank to be constructed on the increment you currently propose to mine.

  None proposed.
- (e) Submit detailed design plans which comply with Sections 780.25(a)(2 and 3) and 816.91-816.93 for each coal processing waste dam and embankment to be constructed on the increment which you currently propose to mine.

  None proposed.
- 3. Diversions. (780.29,816.43, 816.44)

Are diversions of overland flow or stream channel diversions proposed?

(X) Yes () No

If yes, complete the following:

(a) Is the diversion to be permanent?( X ) Yes ( ) No

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

Attachment III-B-2(a)

## CERTIFICATION STATEMENT:

I hereby certify that Attachment III-B-2(a) prepared for D & E Mining, LLC, Flat Rock Mine No. 2, are in accordance with the Regulations of the Alabama Surface Mining Commission as adopted by Act 81-435 of December 18, 1981 and amended to date, and are true and correct to the best of my knowledge and belief.

Leslie G. Stephens, P.E. & P.L.S.

Al Reg. No. 14117-E

BAMA""

09/14/2012 Date

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

#### ATTACHMENT III-B-2(a)

### ADDENDUM TO THE GENERAL PLAN

The addendum to the general plan consists of re-evaluating Basins 009AP and 009P, and adding Slurry Impoundment 001. Attached are detailed design plans for Slurry Impoundment No. 1. Upon written approval from the regulatory authority the slurry impoundment will be constructed and certified to the Regulatory Authority prior to pumping slurry into the impoundment.

Slurry Impoundment No. 1 is to be temporary and will be graded and revegetated. Detailed basin removal plans for the basins will be submitted to the regulatory authority and upon written approval from them will be removed in accordance with the removal plans prior to Phase II Bond Release. General design data is enclosed.

Geologic investigations of the area indicate layers of sandstone, siltstone, shale and minor amounts of bituminous coal and underclay. The coal to be mined by D & E Mining, LLC, will be confined to the Aetna and Upper Cliff Coal Seams. The Upper Cliff Coal Seam only occurs in a small area at the top of a hill approximately 7 to 8 acres in size. The strata in the area is characterized by small scale normal faulting and gentle open folding.

Surface drainage discharge from Basin 009P will flow to Flat Rock Creek.

All diversions are to be temporary and will be re-graded and revegetated. (See diversion ditch criteria).

No existing or proposed underground mines are known to exist within 500' of the permit boundary.

See Attachment III-B-2(a), Watershed Map.

See Attachment III-B-2(a), Basins 009P and 009AP Re-evaluation and Slurry Impoundment No. 1 Detailed Design Plans.

Applicant: D & E Mining, LLC
Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

# Attachment III-B-2(a)

Basin No.	Location	Drainage Area (Acres)
009AP	NE 1/4 of NE 1/4, Section 18	19
009P	NW $1/4$ of NE $1/4$ , Section 18	51
Slurry Impoundment No.1	NE 1/4 of NE 1/4, Section 18	16

All within Township 3 South, Range 9 East, Jackson County, Alabama, as shown by the Flat Rock United States Geological Survey Quadrangle Map.

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

Attachment III-B-2(a)

#### Pond Construction Criteria

The embankment for sediment basins (temporary and permanent) shall be designed and built using the following as minimum criteria:

- 1. The top of the dam shall be no less than 12 feet wide.
- 2. See design sheet for maximum and minimum embankment slopes.
- 3. The foundation and abutments for the impounding structure shall be designed to be stable under all conditions of construction and operation of the impoundments, with a minimum static safety factor of 1.5 for the normal pool with steady seepage saturation conditions, and a seismic safety factor of at least 1.20.
- 4. The dam shall be constructed with a cutoff trench based upon prudent engineering practices for the site. The cutoff shall be located on the dam centerline and be of sufficient depth to extend into a relatively impervious material from which the core of the dam shall also be constructed.
- 5. The embankment foundation area shall be cleared of all organic matter, all surfaces sloped to no steeper than lv:lh, and the entire foundation surface scarified.
- 6. The entire embankment and cutoff trench shall be compacted to 95 percent density, based on standard proctor as outlined in ASTM.
- 7. The material placed in the embankment shall be free of sod, roots, stones over 6 inches in diameter, and other objectionable materials. The fill material shall be placed and spread over the entire fill area, starting at the lowest point of the foundation, in layers not to exceed 12 inches in thickness. Construction of the fill shall be undertaken only at such times that the moisture content of the fill material will permit satisfactory compaction in accordance with paragraph 5.
- 8. The pool area of the basin will be cleared of timber and large undergrowth.
- 9. The primary decant system when consisting of a pipe shall be installed according to Class C pipe installation for embankment bedding.
- 10. The primary decant system shall be equipped with a device, or constructed, such as to insure that subsurface withdrawal is accomplished to prevent discharge of floating solids. If a channel is used as the primary decant a skimmer shall be installed to prevent floating solids from discharging.

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

11. A splash pad or riprap may be required under the discharge of the primary decant system where necessary to insure that the discharge does not erode the embankment.

- 12. The combination primary and secondary decant system shall be designed to safely carry the expected peak flow from a 25 year 6 hour storm. The entire emergency overflow spillway channel will be a stabilized channel and will be stabilized upon completion of construction as specified within the detailed design plans using prudent engineering measures. These measures may consist of lining the spillway with concrete or a durable rock riprap, or the spillway being constructed in consolidated non-erodible material and planted with a mixture or both annual and perennial grasses, or a combination of any or all of the above.
- 13. Sediment basins using a single spillway system shall be an open channel of non-erodible construction consisting of concrete, durable rock riprap or its being constructed in consolidated non-erodible material as specified in the detailed design plans.
- 14. The settled embankment for temporary impoundments shall be a minimum of 1.0 foot above the maximum water elevation for the runoff from a 25 year 6 hour, or a 10 year 24 hour precipitation event (whichever has the greatest runoff). The settled embankment for permanent impoundments shall be a minimum of 1.0 foot above the maximum water elevation for the runoff from a 25 year 6 hour, or a 10 year 24 hour precipitation event (whichever has the greatest runoff).
- 15. If basins are built in series, then the combined decant system for each shall be designed to accommodate the entire contributing drainage area.
- 16. The dam and all disturbed areas shall be seeded with both perennial and annual grasses, fertilized and mulched in order to insure erosion is minimized. Hay bales or riprap may be placed at the toe of the dam immediately upon completion of construction.
- 17. The constructed height of the dam shall be increased a minimum of 5 percent over the design height to allow for settlement over the life of the embankment.
- 18. Final graded slopes of the entire permanent water impoundment area shall not exceed 2.5H-1.0V to provide for adequate safety and access for proposed water users.
- 19. Prior to Phase II bond release, additional data concerning water quality, water quantity, depth, size, configuration, postmining land use, etc., for each proposed permanent water impoundment, shall be submitted to the Regulatory Authority for permanent water impoundment approval.

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

20. All sediment basins will be inspected for stability, erosion, etc. two (2) times a month until removal of the structure or release of the reclamation bond.

- 21. The embankment and spillway will be maintained by repairing any damage such as erosion, slope failure or spillway damage until removal of the structure or release of the performance bond.
- 22. All ponds shall be examined quarterly for structural weakness, instability, erosion, or other hazardous conditions and maintenance performed as necessary. Formal inspections shall be made on an annual basis, including any reports or modifications, in accordance with 880-X-10C-.20[1(j)] of the Alabama Surface Mining Commission Regulations.
- 23. Sediment will be removed from each pond when the accumulated sediment reaches the sediment storage volume as shown on the detailed design sheet.
- Upon completion of mining, successful reclamation and effluent 24. standards being met, each sediment basin not remaining as a permanent water impoundment will be dewatered in an environmentally safe manner (such as siphoning, pumping, etc.) and reclaimed to approximate original contours by the following procedure: permanent diversion channel (designed for a 10 year - 24 hour precipitation event) shall be cut along the outer edge of the basin to re-route drainage around the basin and back through the stabilized spillway to allow reclamation of the sediment basin. The diversion channel shall be designed and grassed as per enclosed information. (See permanent diversion for basin disposal). Upon completion of the diversion channel the back slope of the dam shall be graded to a minimum 3H to 1V slope. The dewatered sediment basin area shall be seeded with some combination of the following: Fescue, bermuda, rye grass, canary grass and willows. After seeding the area shall be mulched. Any additional sediment or embankment material not used to meet original contour, non-toxic, shall be spread in thin layers within the permit area and vegetated as stated in the approved reclamation plan. toxic material encountered in the basin disposal shall be buried and covered with 4 feet of non-toxic material and vegetated as stated in the approved reclamation plan.
- 25. A qualified registered professional engineer or other qualified professional specialist, under the direction of the professional engineer shall conduct regular inspections during construction and upon completion shall inspect each basin for certification purposes.
- 26. Point source discharge embankments shall be constructed and abutments keyed into desirable material if at all possible. In the event that undesirable material is encountered, addition design and construction criteria shall be submitted prior to certification.

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

Attachment III-B-2(a)

#### SPECIFICATIONS FOR COAL PROCESSING WASTE IMPOUNDMENTS

The embankment for coal processing waste will be designed and constructed using the following as minimum criteria:

- 1. Coal processing waste will not be used in the construction of dams and embankments without written approval from the regulatory authority.
- 2. All trees, shrubs, grasses, and other organic material will be cleared and grubbed from the site, and all combustibles will be removed and stockpiled before coal processing waste is placed at a dam or embankment site.
- 3. All surface drainage that may cause erosion to the embankment area or the embankment features will be directed away from the embankment. Diversions designed to divert drainage from the upstream area away from the impoundment area will be designed to carry the peak runoff from a 10 year 24 hour precipitation event. The diversion will be maintained to prevent blockage. Adequate outlets for the discharge from these diversions will be controlled by energy dissipators, riprap channels, and other devices where necessary to reduce erosion, prevent deepening or enlargement of the stream channel, and to minimize disturbance of the hydrologic balance. Also, all diversions delivering runoff from disturbed area must pass thru an approved sediment basin.
- 4. The design freeboard between the lowest point on the embankment crest and the maximum water elevation will be at least 1.5 feet as determined from a 10 year 24 hour or a 25 year 6 hour precipitation event (storm with the greater peak flow).
- 5. The coal processing waste dam or embankment will have a minimum safety factor of 1.5 for the partial pool with steady seepage saturation conditions and the seismic safety factor will be at least 1.2.
- 6. The dam or embankment foundation and abutments will be designed to be stable under all conditions of construction and operations of the impoundment. Sufficient foundation investigations and laboratory testing will be performed to determine safety factors of the dam or embankment loaded to a water level sufficiently stable to support the intended use.
- 7. Spillways and outlet works will be designed to provide adequate protection against erosion and corrosion. Inlets will be protected against blockage.
- 8. The primary decant system shall be equipped with a device, or constructed, such as to insure that subsurface withdrawal is

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

accomplished to prevent discharge of floating solids. If a channel is used as the primary decant a skimmer shall be installed to prevent floating solids from discharging.

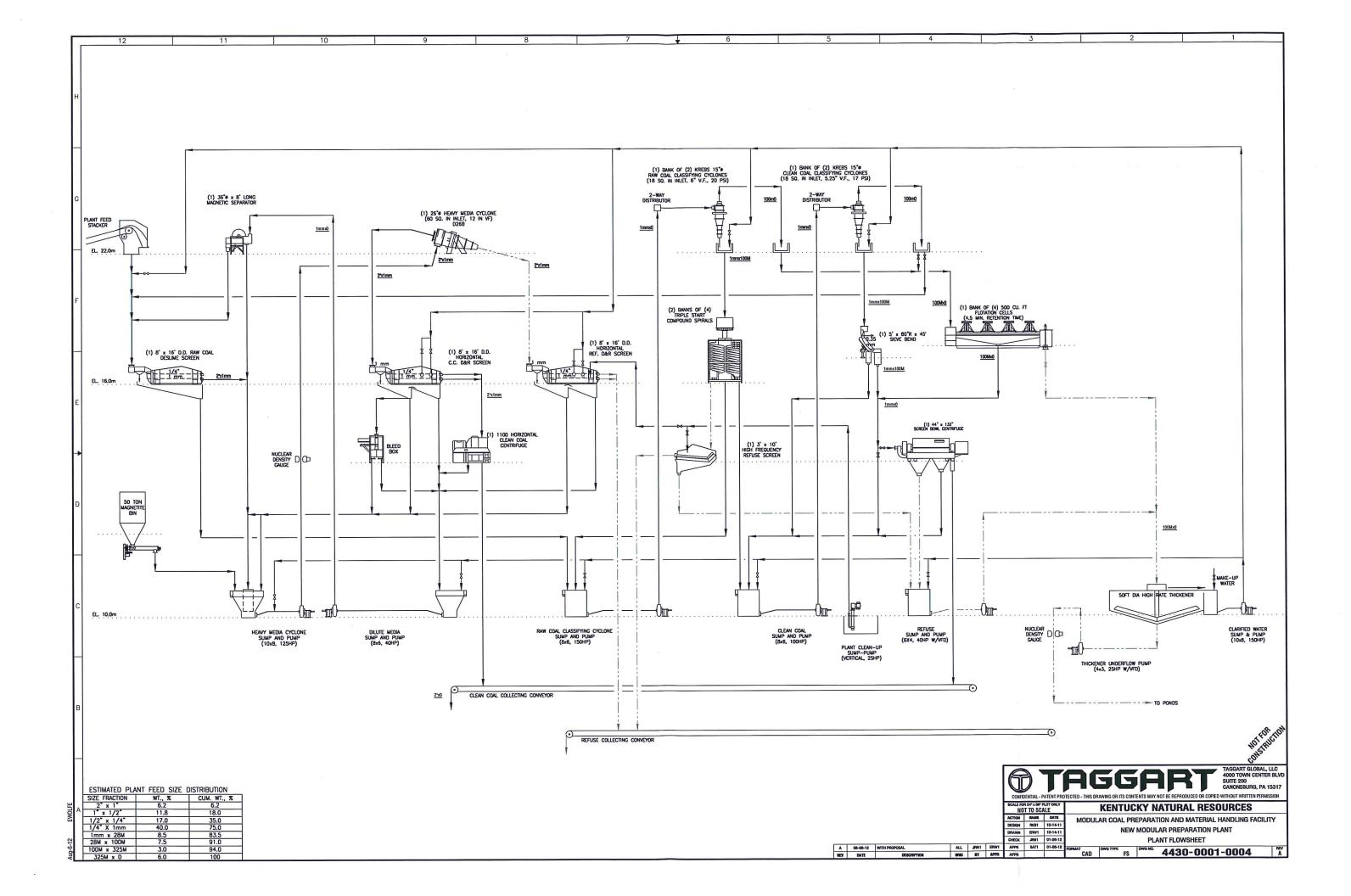
- 9. A splash pad or riprap may be required under the discharge of the primary decant system where necessary to insure that the discharge does not erode the embankment.
- 10. The combination primary and secondary decant system shall be designed to safely carry the expected peak flow from a 25 year 6 hour storm. The entire emergency overflow spillway channel will be a stabilized channel and will be stabilized upon completion of construction as specified within the detailed design plans using prudent engineering measures. These measures may consist of concrete, durable rock riprap, or the spillway being constructed in consolidated non-erodible material, or a combination of any or all of the above.
- 11. Basins using a single spillway system shall be an open channel of non-erodible construction consisting of concrete, durable rock riprap or its being constructed in consolidated non-erodible material.
- 12. Dams or embankments constructed of or impounding waste materials will be designed so that at least 90 percent of the water stored during the design precipitation event will be removed within a ten day period.
- 13. The dam and all disturbed areas will be sowed with both perennial and annual grasses in order to insure erosion is minimized. Hay bales or riprap may be placed at the toe of the dam immediately upon the completion of construction.
- 14. All embankments will be inspected for stability, erosion, etc. two (2) times a month until removal of the structure or release of the performance bond.
- 15. The embankment and spillway will be maintained by repairing any damage such as erosion, slope failure, or spillway damage until removal of the structure or release of the performance bond.
- 16. All impoundments will be examined quarterly for structural weakness, instability, erosion, or other hazardous conditions and maintenance performed as necessary. Formal inspections will be made on an annual basis, including any reports or modifications, in accordance with 880-X-10C-.20(1(j)) of the Alabama Surface Mining Regulations.
- 17. When the accumulated solids contained within the waste impoundment reaches the solids storage volume specified within the detailed design plans, the waste impoundment will be reclaimed im the following manner. The waste impoundment will be dewatered in an

Mine Name: Flat Rock Mine No. 2

Permit Number: P-3935 / Revision R-2

environmentally safe manner (such as siphoning, pumping, etc.). Using existing non-toxic, non-flammable breaker and washer rejected rock materials, construct a working surface on the impoundment which will permit equipment travel for the placement of vegetative cover material and to provide for positive drainage. All rock fill slopes on the impoundment shall have a maximum and minimum grade of 5 percent and 1 percent, respectively. All breaker and washer rejected rock fill shall be spread in one (1) foot maximum layers with a minimum compaction of 90 percent of its maximum dry density as determined by the standard proctor compaction test. thickness of the rock material will be no more than is necessary to support equipment which will be working upon the impoundment Upon the completion of the above mentioned working surface, the graded impoundment surface will be covered with a minimum of four (4) feet of the best available non-acid and nontoxic forming and non-combustible material. All disturbed areas will be vegetated with an appropriate combination of grasses and legumes as stated in the reclamation plan, fertilized, and mulched to ensure a permanent diverse vegetative cover. The cover material will be sampled and analyzed to determine the correct amount of soil amendments to be added to the cover material. amendments, including lime and fertilizer, will be added and disced into the cover material in rates as recommended by laboratory analysis performed upon the cover material. These soil amendments will ensure a diverse effective vegetative growth upon the material.

18. A qualified registered professional engineer or other qualified professional specialist, under the direction of the professional engineer shall conduct regular inspections during construction and upon completion shall inspect each basin for certification purposes. Pond Construction Criteria





Kentucky Natural Resources Modular Coal Preparation Plant Taggart Global Project Number 4430 August 31, 2012 Revision A

August 6, 2012

**VIA EMAIL** 

Attention:

Leslie G. Stephens

SUBJECT:

KENTUCKY NATURAL RESOURCES REFUSE LOADING

MODULAR COAL PREPARATION PLANT TAGGART GLOBAL JOB NUMBER 4430

Dear Leslie Stephens,

The following table defines the plant refuse loading for the nominal and low yield cases. The tons shown are in dry tons, with the coarse being the tons that would report to the refuse belt and stockpile and slurry being the ultrafine tons pumped away to the slurry pond. The refuse tons are based on a 250 dry ton per hour plant feedrate.

REFUSE TONS PER HOUR DRY					
Description	Nominal Yield	Low Yield			
Coarse	86	150			
Slurry	21	24			
TOTAL	107	174			

Table 1: Dry Basis refuse tons at the nominal and low yield cases

Taggart looks forward to working with Kentucky Natural Resources and PERC Engineering Co., Inc. Should you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted, TAGGART GLOBAL, LLC

Andy Dynys

Vice President - Process Engineering

Cc:

D. Placha, J. Stasko, M. Ferguson, E. Wolfe File -

**Taggart** 

**Enclosures:** 

**Process Flowsheet**